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PATENT APPLICATION

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IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Makinen, et al.

Serial No.: 09/997,859

Examiner: Thu Thao Havan

Filing Date: 11/29/04

Group Art Unit: 2672

Title: Systems and Methods for Manipulating a Graphical Display of a Printed Circuit Board Model for an Automated X-ray Inspection System

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Sir:

Transmitted herewith in triplicate is the Appeal Brief in this application with respect to the Notice of Appeal filed on herewith.

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(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

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() The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

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Respectfully submitted,

Makinen, et al.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:

Makinen, *et al.*

Serial No.: 09/997,859

Filed: 11/29/01

For: Systems and Methods for
Manipulating a Graphical
Display of a Printed Circuit
Board Model for an
Automated X-ray Inspection
System

Confirmation No.: 6699

Group Art Unit: 2672

Examiner: Thu Thao Havan

Docket No. 10011248-1

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APPEAL BRIEF UNDER 37 C.F.R. §1.192

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Sir:

This is an appeal from the decision of Examiner Thu Thao Havan, Group Art Unit 2672, of May 17, 2004 (Paper No. 9), rejecting claims 1 - 35 in the present application and making the rejection FINAL.

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I. REAL PARTY IN INTEREST

The real party in interest of the instant application is Agilent Technologies, Inc, a Delaware corporation, having its principal place of business in Palo Alto, California.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF THE CLAIMS

All pending claims 1 - 35 stand rejected. Specifically, the FINAL Office Action rejects claims 1 – 35 under 35 U.S.C. §102(e) as allegedly anticipated by U.S. Patent 6,317,116 to Rosenberg, *et al.* (hereafter “*Rosenberg*”). For the reasons set further herein, Applicants respectfully request that this rejection be overturned.

IV. STATUS OF AMENDMENTS

No claim amendments have been submitted before or after the FINAL Office Action.

V. SUMMARY OF THE INVENTION

The present invention is generally directed to systems and methods for manipulating a graphical display of a printed circuit board model for an automated x-ray inspection system.

Control systems implemented in PCB inspection systems may employ a graphical user interface to assist in generating an inspection program to be implemented by an imaging system and for interfacing with a PCB modeling system. In one embodiment, the graphical user interface (**FIG. 4, GRAPHICAL DISPLAY**) may include a portion (**FIG. 4, 402**) for providing a display having one or more image objects (**FIG. 4, 406**) which, for example, may correspond to various objects on a printed circuit board. For instance, in a graphical display of a model of a printed circuit board (**FIG. 12, 1202**), one or more image objects may

comprise a component on a PCB, a pin on a particular component, etc. (**FIG. 12, objects on PCB 1202**).

In some cases, it may be advantageous for the computer program to be configured such that user selection of image objects is limited to the boundary of one or more target areas (**FIG. 5, 500**), which may also be displayed on the graphical display (**FIG. 4, GRAPHICAL DISPLAY**). In other words, a user may not be able to select image objects that are outside of this target area. For example, the target area on the graphical user interface may correspond to a portion of the printed circuit board that is to be imaged by an x-ray imaging system. Accordingly, from the perspective of the graphical user interface, the target area defines the available image objects that a user may select (**FIG. 5, objects within target area 500; FIG. 12, objects within target areas 1204**). From the perspective of the x-ray imaging system, the target area defines an area to be imaged. Thus, limiting user selection of image objects to the target area may be a means for controlling the x-ray imaging system.

Accordingly, an embodiment of the present invention may be viewed as a method for manipulating a graphical display. For example, one such method may include providing a graphical user interface comprising a first portion for providing a graphical display, the graphical display comprising a plurality of image objects. (**FIG. 3, 302**). Further, the method may include receiving a user selection of a first image object and the first portion of the graphical user interface. (**FIG. 3, 304**). Furthermore, the method may include displaying a target area containing the first image object selected. (**FIG. 3, 306**). The method may also include receiving a user selection of a second image object in the first portion of the graphical user interface (**FIG. 3, 308**), and the step of modifying the display target area such that the target area contains the first and second image objects (**FIG. 3, 310**).

An embodiment of the present invention may be viewed as a method for manipulating a graphical display of a printed circuit board model. **(FIG. 12)**. The printed circuit board model is adapted to be used in an automated x-ray inspection system for detecting defects in a manufactured printed circuit board, which includes one or more components each comprising one or more pins soldered to the printed circuit board. **(FIG. 11)**. One step comprises providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with the printed circuit board. **(FIG. 3, 302)**. The method also may include receiving a user selection of a first image object in the first portion of the graphical user interface. **(FIG. 3, 304)**. The method may also include displaying a target area containing the first image object selected. **(FIG. 3, 306)**. The method may also include receiving a user selection of a second image object in the first portion of the graphical user interface, and modifying the display target area such that the target area contains the first and second image objects. **(FIG. 3, 302)**.

In some embodiments, the step of modifying the displayed target area may comprise displaying the target area such that the first and second image objects are contained within the target area and a maximum number of the image objects not selected are contained in the target area.

In some embodiments, the step of modifying the displayed target area comprises centering the target area with respect to the first and second image objects selected. **(FIG. 6, Target area 500 centered in relation to selected image objects)**.

VII. GROUPING OF THE CLAIMS

The claims are divided into eleven (11) claim groupings, as set out below. For purposes of the argument set forth in this Appeal Brief, one claim from each group will be evaluated and discussed in connection with the prior art. The claim groups include:

- (1) Claim Group I, which comprises claims 1, 4 - 5, 14, and 17 - 18;
- (2) Claim Group II, which comprises claims 2, 7, 15, 20, and 29;
- (3) Claim Group III, which comprises claims 3, 8, 16, 21, and 30;
- (4) Claim Group IV, which comprises claims 6, 12 - 13, 19, 25 - 26, 28, 34, and 35;
- (5) Claim Group V, which comprises claim 9;
- (6) Claim Group VI, which comprises claim 10;
- (7) Claim Group VII, which comprises claim 11;
- (8) Claim Group VIII, which comprises claims 22 and 31;
- (9) Claim Group IX, which comprises claims 23 and 32;
- (10) Claim Group X, which comprises claim 24 and 33; and
- (11) Claim Group XI, which comprises claim 27.

Reasons that Claim Groups Do Not Stand or Fall Together

Although, in reality, all claims of an application are distinct, Applicants have grouped the claims of the present application into eleven (11) distinct claim groups. **One claim for each group has been chosen as the exemplary claim.** The reason that the claims for any given group do not stand or fall with any claims of another group is, ultimately, because they are of differing scope. This differing scope is more specifically set out below.

In regard to Claim Group I, claim 1 (the exemplary claim) is broadly directed to a method for manipulating a graphical display. The method includes *displaying a target area containing the first image object selected*. The method also includes *modifying the displayed target area such that the target area contains the first and second image objects*. If the Board of Patent Appeals determines that claim 1 defines over the cited art of record,

then, claims 1, 4 – 5, 14, and 17 – 18 should be allowed independent of the treatment of the other claims groups.

In regard to claim group II, claim 2 (the exemplary claim) is directed toward a method for manipulating a graphical display including the step of ***centering the target area with respect to the first and second image objects selected***. If the Board of Patent Appeals determines that claim 2 defines over the cited art of record, then claims 2, 7, 15, 20, and 29 should be allowed independent of the treatment of the other claim groups.

In regard to claim group III, claim 3 (the exemplary claim) is directed toward a method for manipulating a graphical display including the step of modifying the displayed target area such that the target area contains the first and second image objects. Furthermore, the ***step of modifying the displayed target area comprises displaying the target area such that the first and second image objects are contained within the target area and a maximum number of the image objects not selected are contained in the target area***. If the Board of Patent Appeals determines that claim 3 defines over the cited art of record, then claims 3, 8, 16, 21, and 30 should be allowed independent of the treatment of the other claim groups.

In regard to claim group IV, claim 6 (the exemplary claim) is directed toward a method for ***manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in a manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board***. The method includes the step of providing a graphical user interface comprising a first portion for ***providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board***. The method also includes displaying a target area containing the first image object selected. The method also includes the step of modifying

the displayed target area such that the target area contains the first and second image objects. If the Board of Patent Appeals determines that claim 6 defines over the cited art of record, then claims 6, 12 - 13, 19, 25 - 26, 28, and 34 - 35 should be allowed independent of the treatment of the other claim groups.

In regard to claim group V, claim 9 (the exemplary claim) is directed toward a method for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in a manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board. The method includes the step of providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board, ***wherein at least one of the plurality of image objects comprises a family object that specifies a type of solder joint.*** If the Board of Patent Appeals determines that claim 9 defines over the cited art of record, then claim 9 should be allowed independent of the treatment of the other claim groups.

In regard to claim group VI, claim 10 (the exemplary claim) is directed toward a method for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in a manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board. The method includes the step of providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board, ***wherein at least one of the plurality of image objects comprises a package object that specifies a type of component.*** If the Board of Patent Appeal

determines that claim 10 defines over the cited art of record, then claim 10 should be allowed independent of the treatment of the other claim groups.

In regard to claim group VII, claim 11 (the exemplary claim) is directed toward a method for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in a manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board. The method includes the step of providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board, *wherein at least one of the plurality of image objects comprises a pin object that specifies a unique pin number of a specific component in the printed circuit board.* If the Board of Patent Appeals determines that claim 11 defines over the cited art of record, then claim 11 should be allowed independent of the treatment of the other claim groups.

In regard to claim group VIII, claim 22 (the exemplary claim) is directed toward a computer program embodied in a computer-readable medium for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board. The computer program comprises logic configured to provide a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with the printed circuit board, *wherein at least one of the plurality of image objects corresponds to a solder joint.* If the Board of Patent Appeals determines that claim 22 defines over the cited art of record, then claims 22 and 31 should be allowed independent of the treatment of the other claim groups.

In regard to claim group IX, claim 23 (the exemplary claim) is directed toward a computer program embodied in a computer-readable medium for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board. The computer program comprises logic configured to provide a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with the printed circuit board, ***wherein at least one of the plurality of image objects corresponds to a component.*** If the Board of Patent Appeals determines that claim 23 defines over the cited art of record, then claims 23 and 32 should be allowed independent of the treatment of the other claim groups.

In regard to claim group X, claim 24 (the exemplary claim) is directed toward a computer program embodied in a computer-readable medium for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board. The computer program comprises logic configured to provide a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with the printed circuit board, ***wherein at least one of the plurality of image objects corresponds to a pin.*** If the Board of Patent Appeals determines that claim 24 defines over the cited art of record, then claims 24 and 33 should be allowed independent of the treatment of the other claim groups.

Finally, in regard to claim group XI, claim 27 (the exemplary claim) is directed toward a system for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for

detecting defects in manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board. As an initial matter, claim 27 is put forth in means-plus-function format. Accordingly, as a matter of law, ***the means-plus-function elements of claim 27 must be construed differently than the corresponding elements of the other claims.*** Therefore, the rejection of claim 1 (of Claim Group I, for example, does not necessarily apply to claim 27.

Additionally, the system of claim 27 includes ***means for providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board.*** The system further includes ***means for displaying a target area such that the target area contains one or more image objects selected and a maximum number of the image objects not selected are contained in the target area.*** If the Board of Patent Appeals determines that claim 27 defines over the cited art of record, then claims 27 should be allowed independent of the treatment of the other claim groups.

VIII. ARGUMENT

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A. Summary of the Argument

1. **Claims 1 – 35 are Patentable Over *Rosenberg*; Rejection Fails to Even Allege That All Features of Claims 6, 19, 27, and 28 are Disclosed by *Rosenberg***

The FINAL Office Action rejects independent claims 1, 6, 19, 27, and 28 as anticipated by *Rosenberg*. As an initial matter, Applicants submit that *Rosenberg* does not disclose each and every feature of independent claims 1, 6, 19, 27, and 28, and these arguments are set forth in the respective claim groups below. But even further, the 102(e) rejection to independent claims 6, 19, 27, and 28 does not even allege that certain features recited in claims 6, 19, 27, and 28 are disclosed by *Rosenberg*.

Rather, the FINAL Office Action simply addresses the elements of independent claim 1 and alleges that claims “**6, 14, 19, and 27-28 are identical to claim 1 above.**” (*Emphasis added*, FINAL Office Action, pg. 6). However, as set forth in more detail below,

independent claims 6, 19, 27, and 28 include several additional features not recited in independent claim 1, not addressed in the FINAL Office Action (or the Advisory Action of May 17, 2004), and not disclosed by *Rosenberg*.

In summary, each of claims 6, 19, 27, and 28 are directed to systems and methods for *manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in a manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board*. However, in contrast to claims 6, 19, 27, and 28, *Rosenberg* is not related to printed circuit boards at all. Rather, *Rosenberg* is related to a force-feedback system for a GUI. Discussion of the specific claim elements, not addressed by the FINAL Office Action, and not disclosed by *Rosenberg*, are discussed with more specifics in the arguments set forth for their respective claim group.

The goal of examination is to clearly articulate any rejection early in the prosecution process so that the Applicants have the opportunity to provide evidence of patentability and otherwise reply completely at the earliest opportunity. MPEP § 706. Thus, the MPEP requires that the FINAL Office Action properly communicate the basis for a rejection so that the *Applicants* may be given a fair opportunity to reply. The MPEP further requires that where a claim is refused for any reason relating to the merits thereof, the ground of rejection should be fully and clearly stated (*see* MPEP § 707.07(d)).

In other words, each and every element of a claim, and its associated limitation, should be addressed in the Office Action by providing clear reasoning as to why the cited art allegedly discloses, teaches, or suggests that element and its associated limitation. In the present case, by not even alleging that particular elements are disclosed by *Rosenberg*, the rejection to each element could not only be characterized as unclear, but the rejection also does not allow the Applicants to provide evidence of patentability. Furthermore, Applicants

submit that the failure of the Office Action to address the missing elements is evidence in itself that these features are not disclosed, taught, or suggested in *Rosenberg*.

Applicants discussed the deficiency of the Office Action to address each and every element of the claims (at least in relation to exemplary claim 6) in a telephonic interview with Examiner Havan on March 9, 2004. Applicants further addressed the missing elements of claims 6, 19, 27, and 28 in the Response to Second Office Action filed March 23, 2004. However, the Advisory Action mailed May 17, 2004, fails to address these missing elements at all.

Accordingly, Applicants respectfully submit that because the FINAL Office Action rejection does not even allege that particular elements of claims 6, 19, 27, and 28 are disclosed, the rejection of these claims has not met the requirements of the MPEP. Furthermore, the failure of the Office Action to allege each and every element of claims 6, 19, 27, and 28 is evidence, in itself, that these elements are not disclosed by *Rosenberg*. Finally, Applicants submit that *Rosenberg* does not disclose each and every element of claims 1, 6, 19, 27, and 28. Accordingly, Applicants submit that the rejection to claims 1, 6, 19, 27, and 28 should be overturned and the claims allowed.

2. *Rosenberg* is Fundamentally Different than the Claimed Invention

While specific differences between Applicants' claimed invention and *Rosenberg* are discussed in more detail with respect to the claim groups below, it is helpful to understand a summary of Applicants' disclosure, in comparison to *Rosenberg*, to more clearly comprehend the numerous fundamental differences with respect to the claimed embodiments.

a. Summary of Applicants' Disclosure

Applicants' disclosure relates to embodiments of a graphical user interface (GUI) which, for example, may be used as a computer interface to control an x-ray inspection machine. For example, in printed circuit board (PCB) manufacturing, an x-ray inspection machine is used to image various components on a PCB throughout the manufacturing process. The GUI may display a graphical representation of an exemplary PCB (*see* FIG. 12) which may be visually, or automatically, compared to an actual x-ray image of a PCB during manufacturing. The GUI could also be used in the facilitating the generation of inspection programs for imaging actual PCBs during the manufacturing process.

Some embodiments of the graphical representation of the PCB may include graphical representations of the components found on the PCB. These graphical representations correspond to the actual components that may appear on the actual x-ray image of the PCB. In practice, during manufacturing, or during the creation of a test program, an operator of the equipment may select a component on the GUI in which the operator wishes to focus on (*e.g.* for inspection). This selection may direct the x-ray inspection equipment, or instruct the test program for the x-ray inspection equipment, to image the actual PCB in the area corresponding to the component selected on the GUI.

While the operator may wish to focus on a particular object, the x-ray machine may actually image a larger area surrounding the selected component. In some cases, this area may include other components that an operator wishes to image in the actual PCB. Accordingly, it is beneficial to display a "target area" on the GUI that will actually be imaged so that an operator may select areas that include the maximum number of components the operator wishes to image. Accordingly, in the context of using the GUI with PCB testing, a

“target area” is simply the area on the GUI that corresponds to an area to be imaged on the actual PCB. (pg. 3, lines 5-6).

In some cases, once an actual PCB has been imaged, or if a test program has already defined an area that will be imaged, it is desirable to only allow an operator to select objects corresponding to components on the actual PCB that are within this defined/imaged area. By selecting an object on the GUI, for example, an operator may be able to ascertain information helpful for determining if the PCB has been manufactured appropriately. By not allowing objects outside this “target area” to be selected, the operator may only select objects in the GUI that correspond to those viewable in the actual x-ray. Accordingly, the “target area” may also be viewed as corresponding to an area including image objects available for the user to select. (pg. 3, lines 4-5).

In many cases simply centering the target area around a desired image object is acceptable. However, in some cases it is beneficial not to center the target area about the object, but rather position the target area in some other specific way in relation to the particular image object. For example, as shown in the embodiment of FIG. 5, if a desired object 406 is located on the lower right corner of the PCB, and the target area 500 is centered about the image object, a large portion of the target area 500 may not include other possible image objects (*e.g.* objects A and B). Accordingly, if the target area 500 is shifted slightly up-and-to-the-left such that the desired image object 406 is in the lower right corner of the target area, more interesting features, such as objects A and B, will be located within the target area.

In other embodiments, if two image objects are selected for x-ray, it may be beneficial to position the target area to include both objects within the same target area such that only one x-ray image is needed. The target area may even change shape to accomplish this.

b. The Rosenberg Reference

Rosenberg apparently does not disclose a GUI having, displaying, or modifying “target areas” similar to that in the Applicants’ disclosure and claims. Furthermore, unlike independent claims 6, 19, 27, and 28 (and dependent claims 7-13, 20-26, and 29-35, which depend therefrom) *Rosenberg* does not relate to printed circuit board (PCB) manufacturing or testing, at all. Rather, *Rosenberg* merely teaches the basic concept of a graphical user interface (GUI) environment. The purported novel features of *Rosenberg* relate to a user-manipulable physical object (*e.g.*, computer mouse 12) and “a force feedback implementation of a graphical environment in which force feedback click surfaces are provided” to “allow a user to select buttons, icons, or other graphical objects (on a GUI) with movement of a mouse or other user manipulable object without requiring a separate manual command gesture, such as the pressing of a button on a mouse.” (Col. 2, lines 38 – 44).

In simpler terms, the *Rosenberg* system apparently employs mechanical interfaces 14 as an intermediary between the computer mouse 12 and the host computer 18 and the associated GUI. *See* Fig. 1. As the computer mouse 12 is moved by a user to control the movement of the cursor in the GUI, the mechanical interfaces 14 may provide a physical force (*e.g.* force feedback) to the computer mouse 12 in certain circumstances. *Rosenberg* states that the mechanical interfaces 14 may be used to eliminate the need to “click” an image object in order to select the image object, or to alleviate problems with positioning the cursor directly over the desired image object. (Col. 2, lines 4 – 35). For example, when a user physically moves the computer mouse 12 to “select” an image object in the GUI with the cursor, the host computer 18 may send signals to the mechanical interfaces 14 to provide a physical force to the computer mouse when the mouse reaches the “click surface.” (Col. 2, lines 45 – 67). When the click surface is contacted by the cursor, the mechanical interfaces 14 apparently provide a force to the computer mouse 12 which opposes further movement of

the computer mouse 12. If the user continues to move the computer mouse 12 against the opposing force to a “trigger position,” the image object is “selected.”

B. Discussion of Claim Group I

The FINAL Office Action rejects claim 1 under 35 U.S.C. § 102(e) as allegedly anticipated by *Rosenberg*. For at least any one of the four reasons set forth below, Applicants respectfully submit that the rejection should be overturned.

It is axiomatic that “[a]nticipation requires the disclosure in a single prior art reference of *each element* of the claims under consideration.” *W.L. Gore & Associates, Inc. v. Garlock, Inc.* 721 F.2d 1540, 1554, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983) (*emphasis added*). Therefore, every claimed feature of the claimed invention must be represented in the applied reference to constitute a proper rejection under 35 U.S.C. § 102(e).

Applicants submit that independent claim 1 is allowable for at least the reason that *Rosenberg* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the element reciting “*displaying a target area containing the first image object selected*” as recited in the method of claim 1. The FINAL Office Action apparently equates an image object with “icons, pull-down menu items, and graphical buttons” as well as any other “images appearing on the display screen which the user may select with a cursor to implement a function of an application program or operating system, such as displaying images, executing an application program, or performing another computer function.” (FINAL Office Action, pgs. 2 – 3). The FINAL Office Action further alleges that targets “are defined regions in the GUI 2 which a cursor may be moved by the user that are associated with one or more forces and which are typically associated with graphical objects of a GUI.” (FINAL Office Action, pg. 2). Additionally, the FINAL Office Action alleges that “such targets can be associated with, for example, graphical objects such as icons, pull-

down menu items, and graphical buttons,” and further alleges that “a target usually is defined as the exact dimensions of its associated graphical object, and is superimposed and ‘attached’ to its associated graphical object such that the target has a constant spatial position with respect to the graphical object.” (FINAL Office Action, pg. 2).

From the perspective of the GUI, as defined in the detailed description of the application, “the target area defines the available image objects that a user may select.” (pg. 3, lines 5-6). Accordingly, the “target area” may be displayed on the user interface to give the user a visual indicator of what image objects the user may select.

From the perspective of the GUI, as defined in the detailed description of the application, “the target area defines the available image objects that a user may select.” (pg. 3, lines 5-6). Accordingly, the “target area” may be displayed on the graphical user interface to give the user a visual indicator of what image objects the user may select.

Despite the FINAL Office Action’s detailed explanation as to the definition of “a target area,” Applicants submit that even assuming, *arguendo*, that a target area is disclosed by *Rosenberg* as alleged, *Rosenberg* does not disclose that such a target area is ***displayed*** as required by the claim language. Rather, *Rosenberg* discloses, at most that “ ‘***targets, as referenced herein are defined regions in the GUI 300***’ to which a cursor may be moved by the user that are associated with one or more forces and which are typically associated with graphical objects of GUI 300.” (*Emphasis added*, col. 14, lines 38 – 41).

A “region in the GUI” is not equivalent to the claimed “displaying a target area.” That is, the “region in the GUI” of *Rosenberg* merely refers to an area or portion of the GUI that is not displayed. Rather, the alleged target areas are merely “associated” with a displayed graphical object such as an icon or button. Accordingly, unlike claim 1, which requires “***displaying*** a target area,” *Rosenberg* does not display the “region in the GUI” as alleged in

the FINAL Office Action. For at least this reason alone, the rejection is improper and should be overturned.

Further, the rejection should be overturned for at least the additional reason that *Rosenberg* does not disclose, teach, or suggest “displaying a target area ***containing the first image object selected***” as recited in claim 1. Again, the Office Action apparently equates a target area with “icons, pull-down menu items, and graphical buttons” as well as any other “images appearing on the display screen which the user may select with a cursor to implement a function of an application program or operating system.” (FINAL Office Action, pgs. 2 – 3).

Accordingly, as best understood, the Office Action would apparently equate the claimed “displayed target area” with *Rosenberg*’s displayed graphical object, such as an icon or graphical button. The Office Action apparently also equates the claimed “first image object selected” with that same button.

However, “the first image object selected” and “the target area” are two separate claim elements. Further, the displayed target area is “containing the first image object selected.” Accordingly, even assuming, *arguendo*, that *Rosenberg* discloses one of these two elements (*e.g.* by assuming that either the claimed target area or the first image object is equivalent to the graphical icon) *Rosenberg* does not disclose both a target area and a first image object. Therefore, *Rosenberg* does not teach, suggest, or disclose the step of “displaying a target area containing the first image object selected” as recited in claim 1. Accordingly, the rejection should be overturned for at least this reason alone.

Claim 1 is patentable over *Rosenberg* for at least the additional reason that *Rosenberg* does not teach, suggest, or disclose the step of “***modifying the displayed target area such that the target area contains the first and second image objects.***” As an initial matter, as

discussed above, *Rosenberg* does not even disclose a “displayed target area.” Rather, the alleged targets are merely “associated” with a displayed icon.

Even assuming, *arguendo*, that *Rosenberg* does disclose a “displayed target area,” *Rosenberg* simply does not disclose “**modifying** the displayed target area” at all. Rather, the alleged target “is superimposed and ‘attached’ to its associated graphical object such that the target has a **constant spatial position** with respect to the graphical object.” (*Emphasis added*, col. 14, lines 46-48). Accordingly, the rejection should be overturned for at least this additional reason alone.

Even more, assuming, *arguendo*, that *Rosenberg* does disclose “modifying the displayed target area,” the rejection should be overturned for at least the additional reason that *Rosenberg* does not disclose that the displayed target area is modified “such that the target area **contains the first and second image objects**” as recited in claim 1. Again, Applicants submit that *Rosenberg* simply does not disclose “**modifying** the displayed target area” at all. Rather, the alleged target “is superimposed and ‘attached’ to its associated graphical object such that the target has a **constant spatial position** with respect to the graphical object.” (*Emphasis added*, col. 14, lines 46-48). Thus, *Rosenberg* does not disclose, teach, or suggest “modifying the displayed target area such that the target area contains the first and second image objects” as recited in claim 1, and the rejection should be overturned for at least this additional reason alone.

Accordingly, for at least any one of the reasons set forth above, Applicants respectfully submit that independent claim 1 defines over *Rosenberg*, and therefore, the rejection should be overturned.

C. Discussion of Claim Group II

The FINAL Office Action rejects claim 2 under 35 U.S.C. § 102(e) as allegedly anticipated by *Rosenberg*. For at least the reasons set forth below, Applicants respectfully submit that the rejection should be overturned.

Applicants submit that claim 2 is allowable for at least the reason that *Rosenberg* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the element reciting that “*the step of modifying the displayed target area comprises centering the target area with respect to the first and second image objects selected*” as recited in claim 2. The FINAL Office Action directs the Applicants to column 14, lines 34 – 63 of *Rosenberg* as disclosing the alleged claim elements. However, Applicants have closely reviewed this section of text, as well as the remainder of the text of *Rosenberg*, and have not found anything that corresponds to “centering the target area with respect to the first and second image objects selected” as recited in claim 2.

At most, *Rosenberg* discloses that “the entire screen or background of GUI 300 can also be considered a ‘target’ which may provide forces on user object 12.” (Col. 14, lines 60 – 62). However, even if the entire screen or background of *Rosenberg* is considered to be equivalent to a target, *Rosenberg* simply does not disclose that the entire screen or background is *centered* with respect to first and second image objects selected. Thus, *Rosenberg* does not disclose, teach, or suggest that “the step of modifying the displayed target area comprises *centering* the target area with respect to the first and second image objects selected” as recited in claim 2. Accordingly, and for at least these reasons, Applicants respectfully submit that dependent claim 2 defines over *Rosenberg* and, therefore, the rejection should be overturned.

D. Discussion of Claim Group III

The FINAL Office Action rejects claim 3 under 35 U.S.C. § 102(e) as allegedly anticipated by *Rosenberg*. For at least the reasons set forth below, Applicants respectfully submit that the rejection should be overturned.

Applicants submit that claim 3 is allowable for at least the reason that *Rosenberg* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the element reciting that “*the step of modifying the displayed target area comprises displaying the target area such that the first and second image objects are contained within the target area and a maximum number of the image objects not selected are contained in the target area*” as recited in claim 3. As an initial matter, as discussed above in relation to claim group I, *Rosenberg* does not disclose “modifying the displayed target area,” and the claim should be allowed for at least this reason alone.

Further, the FINAL Office Action directs the Applicants to col. 14, lines 34 - col. 15, line 7 of *Rosenberg* as disclosing the alleged elements of claim 3. However, Applicants have closely reviewed this section of text, as well as the remainder of the text of *Rosenberg*, and have not found anything that corresponds to “the step of modifying the displayed target area comprises displaying the target area such that the first and second image objects are contained within the target area and a maximum number of the image objects not selected are contained in the target area” as recited in claim 3. Accordingly, and for at least these reasons, Applicants respectfully submit that dependent claim 3 defines over *Rosenberg* and, therefore, the rejection should be overturned.

E. Discussion of Claim Group IV

The FINAL Office Action rejects claim 6 under 35 U.S.C. § 102(e) as allegedly anticipated by *Rosenberg*. For at least any one of the reasons set forth below, Applicants respectfully submit that the rejection should be overturned.

As an initial matter, Applicants submit that the FINAL Office Action has *not even alleged that each and every element of independent claim 6* is disclosed in *Rosenberg*. The FINAL Office Action alleges that “RE claims 6, 14, 19, and 27 – 28, the limitation of claims 6, 14, 19, and 27 – 28 *are identical to claim 1 above*,” and “therefore, claims 6, 14, 19 and 27 – 28 are treated with respect to grounds as set forth for claim 1 above.” (*Emphasis added*, FINAL Office Action, pg. 6).

Applicants respectfully disagree with the Office Action allegation that claim 6 is “identical to claim 1.” Rather, unlike claim 1, claim 6 is directed to “a method for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in a manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board.” Further, unlike claim 1, claim 6 recites “providing a graphical user interface comprising a first portion for *providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board*.”

Each and every element of a claim, and its associated limitation, should be addressed in the Office Action by providing clear reasoning as to why the cited art allegedly discloses, teaches, or suggests that element and its associated limitation. In the present case, by not even alleging that particular elements are disclosed by *Rosenberg*, the rejection could not only be characterized as unclear, but the rejection also does not allow the Applicants to

provide evidence of patentability. Furthermore, Applicants submit that the failure of the Office Action to address the missing elements is evidence in itself that these features are not disclosed, taught, or suggested in the reference. Furthermore, the rejection to claim 6 should be overturned for at least the additional reason that the features of claim 6 are not disclosed, taught, or suggested in *Rosenberg*.

Applicants submit that rejection to claim 6 should be overturned for at least the additional reason that *Rosenberg* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the step of “***providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board.***” Unlike the method for manipulating a graphical display of a printed circuit board model of claim 6, the force feedback system of *Rosenberg* recites only that “object 12 is rigidly coupled to board 72, which, for example, can be a circuit board etched with conductive materials.” (Col. 8, lines 58 – 59). *Rosenberg* further discloses that “board 72 and object 12 may thus be translated along axis X and/or axis Y, shown by arrows 78A and 78B and guided by guides 80, thus providing the object 12 with linear degrees of freedom.” (FIG. 2A, col. 8, lines 61 – 64). Thus, the alleged printed circuit board of *Rosenberg* is part of the mechanical force-feedback interface between an object (e.g. a computer mouse) and a host computer. In contrast to claim 6, the alleged printed circuit board is not for display in the GUI. In that *Rosenberg* does not disclose, teach, or suggest “providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model causing a plurality of image objects associated with a printed circuit board” as recited in claim 6, the rejection should be overturned for this reason alone.

Additionally, Applicants submit that independent claim 6 is allowable for at least the additional reason that *Rosenberg* does not teach, suggest, or disclose the step of “***displaying a***

target area containing the first image object selected’ as recited in the method of claim 6.

The FINAL Office Action apparently equates an image object with “icons, pull-down menu items, and graphical buttons” as well as any other “images appearing on the display screen which the user may select with a cursor to implement a function of an application program or operating system, such as displaying images, executing an application program, or performing another computer function.” (FINAL Office Action, pgs. 2 – 3). The FINAL Office Action further alleges that targets “are defined regions in the GUI 2 which a cursor may be moved by the user that are associated with one or more forces and which are typically associated with graphical objects of a GUI.” (FINAL Office Action, pg. 2). Additionally, the FINAL Office Action alleges that “such targets can be associated with, for example, graphical objects such as icons, pull-down menu items, and graphical buttons,” and further alleges that “a target usually is defined as the exact dimensions of its associated graphical object, and is superimposed and ‘attached’ to its associated graphical object such that the target has a constant spatial position with respect to the graphical object.” (FINAL Office Action, pg. 2).

From the perspective of the GUI, as defined in the detailed description of the application, “the target area defines the available image objects that a user may select.” (pg. 3, lines 5-6). Accordingly, the “target area” may be displayed on the graphical user interface to give the user a visual indicator of what image objects the user may select.

Despite the FINAL Office Action’s detailed explanation as to the definition of “a target area,” Applicants submit that even assuming, *arguendo*, that a target area is disclosed by *Rosenberg* as alleged, *Rosenberg* does not disclose that such a target area is ***displayed*** as required by the claim language. Rather, *Rosenberg* discloses, at most that “***‘targets,’ as referenced herein are defined regions in the GUI 300*** to which a cursor may be moved by

the user that are associated with one or more forces and which are typically associated with graphical objects of GUI 300.” (*Emphasis added*, col. 14, lines 38 – 41).

A “region in the GUI” is not equivalent to the claimed “displaying a target area.” That is, the “region in the GUI” of *Rosenberg* merely refers to an area or portion of the GUI that is not displayed. Rather, the alleged target areas are merely “associated” with a displayed graphical object such as an icon or button. Accordingly, unlike claim 6, which requires “*displaying* a target area,” *Rosenberg* does not display the “region in the GUI” as alleged in the FINAL Office Action. For at least this reason alone, the rejection is improper and should be overturned.

Further, the rejection should be overturned for at least the additional reason that *Rosenberg* does not disclose, teach, or suggest “displaying a target area *containing the first image object selected*” as recited in claim 6. Again, the Office Action apparently equates a target area with “icons, pull-down menu items, and graphical buttons” as well as any other “images appearing on the display screen which the user may select with a cursor to implement a function of an application program or operating system.” (FINAL Office Action, pgs. 2 – 3).

Accordingly, as best understood, the Office Action would apparently equate the claimed “displayed target area” with *Rosenberg*’s displayed graphical object, such as an icon or graphical button. The Office Action apparently also equates the claimed “first image object selected” with that same button.

However, “the first image object selected” and “the target area” are two separate claim elements. Further, the displayed target area is “containing the first image object selected.” Accordingly, even assuming, *arguendo*, that *Rosenberg* discloses one of these two elements (*e.g.* by assuming that either the claimed target area or the first image object is equivalent to a graphical icon) *Rosenberg* does not disclose both a target area and a first

image object. Therefore, *Rosenberg* does not teach, suggest, or disclose the step of “displaying a target area containing the first image object selected” as recited in claim 6. Accordingly, the rejection should be overturned for at least this reason alone.

Claim 6 is patentable over *Rosenberg* for at least the additional reason that *Rosenberg* does not teach, suggest, or disclose the step of “***modifying the displayed target area such that the target area contains the first and second image objects.***” As an initial matter, as discussed above, *Rosenberg* does not even disclose a “displayed target area.” Rather, the alleged targets are merely “associated” with a displayed icon.

Even assuming, *arguendo*, that *Rosenberg* does disclose a “displayed target area,” *Rosenberg* simply does not disclose “***modifying the displayed target area***” at all. Rather, the alleged target “is superimposed and ‘attached’ to its associated graphical object such that the target has a ***constant spatial position*** with respect to the graphical object.” (*Emphasis added*, col. 14, lines 46-48). Accordingly, the rejection should be overturned for at least this additional reason alone.

Even more, assuming, *arguendo*, that *Rosenberg* does disclose “modifying the displayed target area,” the rejection should be overturned for at least the additional reason that *Rosenberg* does not disclose that the displayed target area is modified “such that the target area ***contains the first and second image objects***” as recited in claim 6. Again, Applicants submit that *Rosenberg* simply does not disclose “***modifying the displayed target area***” at all. Rather, the alleged target “is superimposed and ‘attached’ to its associated graphical object such that the target has a ***constant spatial position*** with respect to the graphical object.” (*Emphasis added*, col. 14, lines 46-48). Thus, *Rosenberg* does not disclose, teach, or suggest “modifying the displayed target area such that the target area contains the first and second image objects” as recited in claim 6, and the rejection should be overturned for at least this additional reason.

Accordingly, and for at least these reasons, Applicants respectfully submit that independent claim 6 defines over *Rosenberg*, and therefore, the rejection should be overturned.

F. Discussion of Claim Group V

The FINAL Office Action rejects claim 9 under 35 U.S.C. § 102(e) as allegedly anticipated by *Rosenberg*. For at least the reasons set forth below, Applicants respectfully submit that the rejection should be overturned.

Applicants submit that claim 9 is allowable for at least the reason that *Rosenberg* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the element reciting that “*at least one of the plurality of image objects comprises a family object that specifies a type of solder joint*” as recited in claim 9.

Rosenberg discloses, at most, that “in the GUI context, ‘graphical objects’ are those images appearing on a display screen which the user may select with a cursor to implement a function of an application program or operating system, such as displaying images, executing an application program, or performing another computer function.” (Col. 14, lines 48 – 54). The recited language is simply not equivalent to “a family object that specifies a type of solder joint” as recited in claim 9.

Accordingly, *Rosenberg* does not disclose, teach, or suggest that “at least one of the plurality of image objects comprises a family object that specifies a type of solder joint,” and for at least this reason, the rejection of claim 9 should be overturned.

G. Discussion of Claim Group VI

The FINAL Office Action rejects claim 10 under 35 U.S.C. § 102(e) as allegedly anticipated by *Rosenberg*. For at least the reasons set forth below, Applicants respectfully submit that the rejection should be overturned.

Applicants submit that claim 10 is allowable for at least the reason that *Rosenberg* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the element reciting that “*at least one of the plurality of image objects comprises a package object that specifies a type of component.*”

Rosenberg discloses, at most, that “in the GUI context, ‘graphical objects’ are those images appearing on a display screen which the user may select with a cursor to implement a function of an application program or operating system, such as displaying images, executing an application program, or performing another computer function.” (Col. 14, lines 48 – 54). The recited language is simply not equivalent to “a package object that specifies a type of component” as recited in claim 10.

Accordingly, *Rosenberg* does not disclose, teach, or suggest that “at least one of the plurality of image objects comprises a package object that specifies a type of component,” and for at least this reason, the rejection to claim 10 should be overturned.

H. Discussion of Claim Group VII

The FINAL Office Action rejects claim 11 under 35 U.S.C. § 102(e) as allegedly anticipated by *Rosenberg*. For at least the reasons set forth below, Applicants respectfully submit that the rejection should be overturned.

Applicants submit that claim 11 is allowable for at least the reason that *Rosenberg* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the

element reciting that “*at least one of the plurality of image objects comprises a pin object that specifies a unique pin number for a specific component in the printed circuit board.*”

Rosenberg discloses, at most, that “in the GUI context, ‘graphical objects’ are those images appearing on a display screen which the user may select with a cursor to implement a function of an application program or operating system, such as displaying images, executing an application program, or performing another computer function.” (Col. 14, lines 48 – 54). The recited language is simply not equivalent to “a pin object that specifies a unique pin number for a specific component in the printed circuit board” as recited in claim 11.

Accordingly, *Rosenberg* does not disclose, teach, or suggest that “at least one of the plurality of image objects comprises a pin object that specifies a unique pin number for a specific component in the printed circuit board,” and for at least this reason, the rejection to claim 11 should be overturned.

I. Discussion of Claim Group VIII

The FINAL Office Action rejects claim 22 under 35 U.S.C. § 102(e) as allegedly anticipated by *Rosenberg*. For at least the reasons set forth below, Applicants respectfully submit that the rejection should be overturned.

Applicants submit that claim 22 is allowable for at least the reason that *Rosenberg* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the element reciting that “*at least one of the plurality of image objects corresponds to a solder joint.*”

Rosenberg discloses, at most, that “in the GUI context, ‘graphical objects’ are those images appearing on a display screen which the user may select with a cursor to implement a function of an application program or operating system, such as displaying images, executing

an application program, or performing another computer function.” (Col. 14, lines 48 – 54). The recited language is simply not equivalent a solder joint” as recited in claim 22.

Accordingly, *Rosenberg* does not disclose, teach, or suggest that “at least one of the plurality of image objects corresponds to a solder joint,” and for at least this reason, the rejection to claim 22 should be overturned.

J. Discussion of Claim Group IX

The FINAL Office Action rejects claim 23 under 35 U.S.C. § 102(e) as allegedly anticipated by *Rosenberg*. For at least the reasons set forth below, Applicants respectfully submit that the rejection should be overturned.

Applicants submit that claim 23 is allowable for at least the reason that *Rosenberg* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the element reciting that “*at least one of the plurality of image objects corresponds to a type of component.*”

Rosenberg discloses, at most, that “in the GUI context, ‘graphical objects’ are those images appearing on a display screen which the user may select with a cursor to implement a function of an application program or operating system, such as displaying images, executing an application program, or performing another computer function.” (Col. 14, lines 48 – 54). The recited language is simply not equivalent to “a type of component” as recited in claim 23.

Accordingly, *Rosenberg* does not disclose, teach, or suggest that “at least one of the plurality of image objects corresponds to a component,” and for at least this reason, the rejection to claim 23 should be overturned.

K. Discussion of Claim Group X

The FINAL Office Action rejects claim 24 under 35 U.S.C. § 102(e) as allegedly anticipated by *Rosenberg*. For at least the reasons set forth below, Applicants respectfully submit that the rejection should be overturned.

Applicants submit that claim 23 is allowable for at least the reason that *Rosenberg* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the element reciting that “*at least one of the plurality of image objects corresponds to a pin.*”

However, *Rosenberg* discloses, at most, that “in the GUI context, ‘graphical objects’ are those images appearing on a display screen which the user may select with a cursor to implement a function of an application program or operating system, such as displaying images, executing an application program, or performing another computer function.” (Col. 14, lines 48 – 54). The recited language is simply not equivalent to “a pin” as recited in claim 24.

Accordingly, *Rosenberg* does not disclose, teach, or suggest that “at least one of the plurality of image objects corresponds to a pin,” and for at least this reason, the rejection to claim 24 should be overturned.

L. Discussion of Claim Group XI

The FINAL Office Action rejects claim 27 under 35 U.S.C. § 102(e) as allegedly anticipated by *Rosenberg*. For at least any one of the reasons set forth below, Applicants respectfully submit that the rejection should be overturned.

As an initial matter, claim 27 sets forth elements using means-plus-function language. Pursuant to 35 U.S.C. § 112(6), a claim element recited in means-plus-function format “shall be construed to cover the corresponding structure, material, or acts described in the

specification and equivalents thereof.” 35 U.S.C. § 112, ¶ 6. The Federal Circuit has clearly endorsed this statutory mandate by holding that claims interpreted under 35 U.S.C. § 112, paragraph 6, are limited to the corresponding structure disclosed in the specification and its equivalents. *Kahn v. General Motors Corp.*, 135 F.3d 1472, 45 U.S.P.Q.2d 1608 (Fed. Cir. 1998).

There should be no question but that the elements recited in claim 27 are to be construed pursuant to 35 U.S.C. § 112, paragraph 6. In *Greenberg v. Ethicon Endo-Surgical Inc.*, 91 F.3d 1580, 39 U.S.P.Q. 2d 1783 (Fed. Cir. 1996), the Federal Circuit stated that the use of “means for” language generally invokes 112(6). Indeed, only if means-plus-function claim elements recite sufficient structure to carry out the function are they taken out of the ambit of 35 U.S.C. § 112, paragraph 6. *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 41 U.S.P.Q.2d 1001 (Fed. Cir. 1996).

Indeed, the Federal Circuit reiterated in *Sage Products, Inc. v. Devon Industries, Inc.*, 126 F.3d 1420, 44 U.S.P.Q.2d 1103 (Fed. Cir. 1998) that “the use of the word ‘means,’ which is part of the classic template for functional claim elements, gives rise to ‘a presumption that the inventor used the term advisedly to invoke the statutory mandates for means-plus-function clauses.” Ultimately, the Court in *Sage* construed the relevant claim elements under 35 U.S.C. § 112(6), because ‘means’ were recited, and the claim elements did not “explicitly recite[s] the structure, material, or acts needed to perform the [recited] functions. *Sage* at p. 1428. The Federal Circuit further acknowledged this presumption in *Al-Site Corp. v. VSI International, Inc.*, 174 F.3d 1308, 50 U.S.P.Q.2d 1161 (Fed. Cir. 1999).

Thus, claim elements expressed in “means” plus function format are construed in accordance with 35 U.S.C. § 112, paragraph 6, as set forth above, and as further described in *In re Donaldson* 16 F.3d 1189, 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994)(*en banc*). Therefore, the various “means” elements must be construed in accordance with the structure set forth in the

present specification. In this regard, Applicants note that, in *In re Donaldson*, The Board of Patent Appeals and Interferences advanced the legal proposition that “limitations appearing in the specification are *not* to be read into the claims of an application.” *In re Donaldson* at 1848. This argument, however, was rejected by the Federal Circuit, which held, as a matter of law, that “one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure ... described therein, and equivalents thereof. *In re Donaldson* at 1848. Furthermore, the holding in *In re Donaldson* does not conflict with the principle that claims are to be given their broadest reasonable interpretation during prosecution. *In re Donaldson* at 1850.

The means-plus-function elements of claim 27 must be construed differently than the corresponding elements of the other claims. Therefore, the rejection of claim 1, for example, does not necessarily apply to claim 27. The FINAL Office Action, however, failed to differentiate the elements in this way. For at least this reason, Applicants submit that the rejection of claim 27 is improper and should be overturned, as the rejection is incomplete and legally deficient.

As a separate and independent bases for patentability, Applicants submit that the FINAL Office Action has ***not even alleged that each and every element of independent claim 27*** is disclosed in *Rosenberg*. The FINAL Office Action alleges that “RE claims 6, 14, 19, and 27 – 28, the limitation of claims 6, 14, 19, and 27 – 28 ***are identical to claim 1 above***,” and “therefore, claims 6, 14, 19 and 27 – 28 are treated with respect to grounds as set forth for claim 1 above.” (*Emphasis added*, FINAL Office Action, pg. 6).

Applicants respectfully disagree with the Office Action allegation that claim 27 is “identical to claim 1.” Rather, unlike claim 1, claim 27 is directed to “a system for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in a

manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board.” Further, unlike claim 1, claim 27 recites “***means for providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board,***” and a “***means for displaying a target area such that the target area contains one or more image objects selected and a maximum number of the image objects not selected are contained in the target area.***”

Each and every element of a claim, and its associated limitation, should be addressed in the Office Action by providing clear reasoning as to why the cited art allegedly discloses, teaches, or suggests that element and its associated limitation. In the present case, by not even alleging that particular elements are disclosed by *Rosenberg*, the rejection could not only be characterized as unclear, but the rejection also does not allow the Applicants to provide evidence of patentability. Furthermore, Applicants submit that the failure of the Office Action to address the missing elements is evidence in itself that these features are not disclosed, taught, or suggested in the reference. Furthermore, the rejection to claim 27 should be overturned for at least the additional reason that the features of claim 27 are not disclosed, taught, or suggested in *Rosenberg*.

Applicants submit that rejection to claim 27 should be overturned for at least the additional reason that *Rosenberg* does not disclose, teach, or suggest anywhere in the specification or in the figures at least a “***means for providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board.***” Unlike the system for manipulating a graphical display of a printed circuit board model of claim 27, the force feedback system of *Rosenberg* recites only that “object 12 is rigidly coupled to board 72, which, for example, can be a circuit board etched with conductive materials.” (Col. 8,

lines 58 – 59). *Rosenberg* further discloses that “board 72 and object 12 may thus be translated along axis X and/or axis Y, shown by arrows 78A and 78B and guided by guides 80, thus providing the object 12 with linear degrees of freedom.” (FIG. 2A, col. 8, lines 61 – 64). Thus, the alleged printed circuit board of *Rosenberg* is part of the mechanical force-feedback interface between an object (e.g. a computer mouse) and a host computer.

In contrast to claim 27, the alleged printed circuit board is not for display in the GUI. In that *Rosenberg* does not disclose, teach, or suggest “means for providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model causing a plurality of image objects associated with a printed circuit board” as recited in claim 27, the rejection should be overturned for at least this reason alone.

Claim 27 is patentable over *Rosenberg* for at least the additional reason that *Rosenberg* does not teach, suggest, or disclose a “means for **displaying a target area** such that the target area contains one or more image objects selected and a maximum number of the image objects not selected are contained in the target area” as recited in the system of claim 27. The FINAL Office Action apparently equates an image object with “icons, pull-down menu items, and graphical buttons” as well as any other “images appearing on the display screen which the user may select with a cursor to implement a function of an application program or operating system, such as displaying images, executing an application program, or performing another computer function.” (FINAL Office Action, pgs. 2 – 3). The FINAL Office Action further alleges that targets “are defined region in the GUI 2 which a cursor may be moved by the user that are associated with one or more forces and which are typically associated with graphical objects of a GUI.” (FINAL Office Action, pg. 2). Additionally, the FINAL Office Action alleges that “such targets can be associated with, for example, graphical objects such as icons, pull-down menu items, and graphical buttons,” and further alleges that “a target usually is defined as the exact dimensions of its associated

graphical object, and is superimposed and ‘attached’ to its associated graphical object such that the target has a constant spatial position with respect to the graphical object.” (FINAL Office Action, pg. 2).

From the perspective of the GUI, as defined in the detailed description of the application, “the target area defines the available image objects that a user may select.” (pg. 3, lines 5-6). Accordingly, the “target area” may be displayed on the graphical user interface to give the user a visual indicator of what image objects the user may select.

Despite the FINAL Office Action’s detailed explanation as to the definition of “a target area,” Applicants submit that even assuming, *arguendo*, that a target area is disclosed by *Rosenberg* as alleged, *Rosenberg* does not disclose that such a target area is ***displayed*** as required by the claim language. Rather, *Rosenberg* discloses, at most that “ ‘***targets, as referenced herein are defined regions in the GUI 300***’ to which a cursor may be moved by the user that are associated with one or more forces and which are typically associated with graphical objects of GUI 300.” (*Emphasis added*, col. 14, lines 38 – 41).

A “region in the GUI” is not equivalent to the claimed “displaying a target area.” That is, the “region in the GUI” of *Rosenberg* merely refers to an area or portion of the GUI that is not displayed. Rather, the alleged target areas are merely “associated” with a displayed graphical object such as an icon or button. Accordingly, unlike claim 27, which requires “means for ***displaying*** a target area,” *Rosenberg* does not display the “region in the GUI” as alleged in the FINAL Office Action. For at least this reason alone, the rejection is improper and should be overturned.

Further, the rejection should be overturned for at least the additional reason that *Rosenberg* does not disclose, teach, or suggest a “means for ***displaying a target area such that the target area contains one or more image objects selected***” as recited in claim 27. Again, the Office Action apparently equates a target area with “icons, pull-down menu items,

and graphical buttons” as well as any other “images appearing on the display screen which the user may select with a cursor to implement a function of an application program or operating system.” (FINAL Office Action, pgs. 2 – 3).

Accordingly, as best understood, the Office Action would apparently equate the claimed “displayed target area” with *Rosenberg*’s displayed graphical object, such as an icon or graphical button. The Office Action apparently also equates the claimed “one or more image objects selected” with that same button.

However, “one or more image objects selected” and “the target area” are two separate claim elements. The displayed target area is “containing the first image object selected.” Accordingly, even assuming, *arguendo*, that *Rosenberg* discloses one of these two elements (*e.g.* by assuming that either the claimed target area or the first image object is equivalent to a graphical icon) *Rosenberg* does not disclose both a target area and a first image object. Therefore, *Rosenberg* does not teach, suggest, or disclose “means for displaying a target area such that the target area contains one or more image objects selected” as recited in claim 27. Accordingly, the rejection should be overturned for at least this reason alone.

Claim 27 is patentable over *Rosenberg* for at least the additional reason that even assuming, *arguendo*, that *Rosenberg* does disclose “means for displaying a target area” and the displayed target area “contains one or more image objects selected,” *Rosenberg* does not disclose displaying the target area “such that the target area contains the one or more image objects selected **and a maximum number of the image objects not selected are contained in the target area**” as recited in claim 27.

The FINAL Office Action directs the Applicants to col. 14, lines 34 - col. 15, line 7 of *Rosenberg*. However, Applicants have closely reviewed this section of text, as well as the remainder of the text and figures of *Rosenberg*, and have not found anything that corresponds to a “means for displaying a target area such that the target area contains one or more image

objects selected and a maximum number of the image objects not selected are contained in the target area” as recited in claim 27. For at least this additional reason alone, the rejection should be overturned.

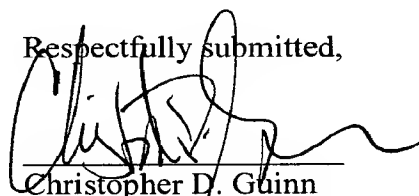
Accordingly, Applicants submit that the rejection of claim 27 is legally deficient and improper as a matter of law, and for at least any one of these reasons, the rejection of claim 27 should be overturned.

IX. CONCLUSION

Based upon the foregoing discussion, Applicants respectfully request that the FINAL rejection of claims 1 - 35 be overruled and overturned by the Board, and that the application be allowed to issue as a patent with all pending claims 1-35.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to Deposit Account No. 50-1078.

Respectfully submitted,



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X. APPENDIX

Claims

1. A method for manipulating a graphical display, the method comprising the steps of:

providing a graphical user interface comprising a first portion for providing a graphical display, the graphical display comprising a plurality of image objects;

receiving a user selection of a first image object in the first portion of the graphical user interface;

displaying a target area containing the first image object selected;

receiving a user selection of a second image object in the first portion of the graphical user interface; and

modifying the displayed target area such that the target area contains the first and second image objects.

2. The method of claim 1, wherein the step of modifying the displayed target area comprises centering the target area with respect to the first and second image objects selected.

3. The method of claim 1, wherein the step of modifying the displayed target area comprises displaying the target area such that the first and second image objects are contained within the target area and a maximum number of the image objects not selected are contained in the target area.

4. The method of claim 1, wherein the target area comprises a square.

5. The method of claim 1, wherein the step of receiving a user selection of a first image object and the step of receiving a user selection of a second image object is via a cursor manipulated by a mouse.

6. A method for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in a manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board, the method comprising the steps of:

providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board;

receiving a user selection of a first image object in the first portion of the graphical user interface;

displaying a target area containing the first image object selected;

receiving a user selection of a second image object in the first portion of the graphical user interface; and

modifying the displayed target area such that the target area contains the first and second image objects.

7. The method of claim 6, wherein the step of modifying the displayed target area comprises centering the target area with respect to the first and second image objects selected.

8. The method of claim 6, wherein the step of modifying the displayed target area comprises displaying the target area such that the first and second image objects are contained within the target area and a maximum number of the image objects not selected are contained in the target area.

9. The method of claim 6, wherein at least one of the plurality of image objects comprises a family object that specifies a type of solder joint.

10. The method of claim 6, wherein at least one of the plurality of image objects comprises a package object that specifies a type of component.

11. The method of claim 6, wherein at least one of the plurality of image objects comprises a pin object that specifies a unique pin number for a specific component in the printed circuit board.

12. The method of claim 6, wherein the target area comprises a square.

13. The method of claim 6, wherein the step of receiving a user selection of a first image object and the step of receiving a user selection of a second image object is via a cursor manipulated by a mouse.

14. A computer program embodied in a computer-readable medium for manipulating a graphical display, the computer program comprising logic configured to:

provide a graphical user interface comprising a first portion for providing a graphical display, the graphical display comprising a plurality of image objects;

receive a user selection of a first image object in the first portion of the graphical user interface;

display a target area containing the first image object selected;

receive a user selection of a second image object in the first portion of the graphical user interface; and

modify the displayed target area such that the target area contains the first and second image objects.

15. The computer program of claim 14, wherein the logic is further configured to modify the displayed target area by centering the target area with respect to the first and second image objects selected.

16. The computer program of claim 14, wherein the logic is further configured to modify the displayed target area by displaying the target area such that the first and second image objects are contained within the target area and a maximum number of the image objects not selected are contained in the target area.

17. The computer program of claim 14, wherein the target area comprises a square.

18. The computer program of claim 14, wherein the logic is further configured to receive the user selection of a first image object and a second image object via a cursor manipulated by a mouse.

19. A computer program embodied in a computer-readable medium for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in a manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board, the computer program comprising logic configured to:

provide a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board;

receive a user selection of a first image object in the first portion of the graphical user interface;

display a target area containing the first image object selected;

receive a user selection of a second image object in the first portion of the graphical user interface; and

modify the displayed target area such that the target area contains the first and second image objects.

20. The computer program of claim 19, wherein the logic is further configured to modify the displayed target area by centering the target area with respect to the first and second image objects selected.

21. The computer program of claim 19, wherein the logic is further configured to modify the displayed target area by displaying the target area such that the first and second image objects are contained within the target area and a maximum number of the image objects not selected are contained in the target area.

22. The computer program of claim 19, wherein at least one of the plurality of image objects corresponds to a solder joint.

23. The computer program of claim 19, wherein at least one of the plurality of image objects corresponds to a component.

24. The computer program of claim 19, wherein at least one of the plurality of image objects corresponds to a pin.

25. The computer program of claim 20, wherein the target area comprises a square.

26. The computer program of claim 19, wherein the logic is further configured to receive the user selection of a first image object a second image via a cursor manipulated by a mouse.

27. A system for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in a manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board, the system comprising:

a means for providing a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board;

a means for receiving a user selection of one or more of the image objects in the first portion of the graphical user interface; and

a means for displaying a target area such that the target area contains one or more image objects selected and a maximum number of the image objects not selected are contained in the target area.

28. A system for manipulating a graphical display of a printed circuit board model, the printed circuit board model adapted to be used in an automated x-ray inspection system for detecting defects in a manufactured printed circuit board having one or more components comprising one or more pins soldered to the printed circuit board, the system comprising:

logic configured to:

provide a graphical user interface comprising a first portion for providing a graphical display of a printed circuit board model comprising a plurality of image objects associated with a printed circuit board;

receive a user selection of a first image object in the first portion of the graphical user interface;

display a target area containing the first image object selected;

receive a user selection of a second image object in the first portion of the graphical user interface; and

modify the displayed target area such that the target area contains the first and second image objects;

a processing device configured to implement the logic; and

a display device configured to support the graphical user interface

29. The system of claim 28, wherein the logic is further configured to modify the displayed target area by centering the target area with respect to the first and second image objects selected.

30. The system of claim 28, wherein the logic is further configured to modify the displayed target area by displaying the target area such that the first and second image objects are contained within the target area and a maximum number of the image objects not selected are contained in the target area.

31. The system of claim 28, wherein at least one of the plurality of image objects corresponds to a solder joint.

32. The system of claim 28, wherein at least one of the plurality of image objects corresponds to a component.

33. The system of claim 28, wherein at least one of the plurality of image objects corresponds to a pin.

34. The system of claim 29, wherein the target area comprises a square.

35. The system of claim 28, wherein the logic is further configured to receive the user selection of a first image object a second image via a cursor manipulated by a mouse.